

## **IN THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application.

### **Listing of Claims**

Claim 1 to 13 (canceled).

Claim 14 (currently amended): A method for designing a nuclear fuel assembly which is intended to be positioned in a nuclear reactor, the assembly comprising a plurality of guide tubes and a control cluster which comprises a plurality of control rods and a support for control rods, the control rods and the guide tubes extending in parallel with a longitudinal direction, each of the control rods being received in a guide tube in order to form pairs comprising guide tubes/ control rods, each of the guide tubes comprising a lower damping portion which comprises at least a section of reduced inside diameter, the lower damping portion configured to contain a fluid for damping a fall of the control rod which is received in the guide tube, the section of reduced inside diameter surrounding the control rod with a radial passage gap when the control rod is introduced in the guide tube ~~wherein for at least one pair comprising a guide tube/control rod,~~ the method comprising:

calculating an expected falling speed of the control rods upon entry into the lower damping portions when the control cluster falls in an event of a shutdown of the nuclear reactor;

calculating, based on the falling speed, a progression of the falling speed of the control rods in the lower damping portions;

calculating, based on the progression of the falling speed of the control rods in the lower damping portions, a maximum elevated pressure produced in the fluid contained in the lower damping portions; ~~and~~

calculating, based on the maximum elevated pressure, a maximum circumferential stress produced in the lower damping portions; and

designing the guide tubes as a function of the maximum circumferential stress.

Claim 15 (previously presented): The method according to claim 14, further comprising:  
verifying, using the maximum circumferential stress, that a maximum stress  
admissible by the guide tube has not been exceeded.

Claim 16 (previously presented): The method according to claim 14, wherein the  
calculating, based on the falling speed, a progression of the falling speed of the control rod in  
the lower damping portion, is preformed using a higher value for the radial passage gap and  
the step of calculating, based on the progression of the falling speed of the control rod in the  
lower damping portion, a maximum elevated pressure produced in the fluid contained in the  
lower damping portion, is performed using a lower value for the radial passage gap.

Claim 17 (previously presented): The method according to claim 16, wherein the higher  
value is the maximum statistical value for the passage gap.

Claim 18 (previously presented): The method according to claim 16, wherein the lower  
value is the minimum statistical value for the passage gap.

Claims 19 to 25 (canceled).

Claim 26 (new): A method for designing a part of a nuclear fuel assembly which is  
intended to be positioned in a nuclear reactor, the assembly comprising a plurality of guide  
tubes and a control cluster which comprises a plurality of control rods and a support for  
control rods, the control rods and the guide tubes extending in parallel with a longitudinal  
direction, each of the control rods being received in a guide tube in order to form pairs  
comprising guide tubes/ control rods, each of the guide tubes comprising a lower damping  
portion which comprises at least a section of reduced inside diameter, the lower damping  
portion configured to contain a fluid for damping a fall of the control rod which is received in  
the guide tube, the section of reduced inside diameter surrounding the control rod with a  
radial passage gap when the control rod is introduced in the guide tube wherein for at least

one pair comprising a guide tube/control rod, the method comprising:

- calculating an expected falling speed of the control rods upon entry into the lower damping portions when the control cluster falls in an event of a shutdown of the nuclear reactor;

- calculating, based on the expected falling speed, a progression of the falling speed of the control rods in the lower damping portions;

- calculating, based on the progression of the falling speed of the control rods in the lower damping portions, a maximum elevated pressure produced in the fluid contained in the lower damping portions;

- calculating, based on the maximum elevated pressure, a maximum circumferential stress produced in the lower damping portions; and

- designing the guide tube of the at least one pair as a function of the maximum circumferential stress.